Array Coding Questions:

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1.Question: Write a program to input n integers into an array and display them.

2.Question: Write a program to find the sum of all elements in a 1D array.

3.Question: Write a program to find the maximum and minimum element in a 1D array.

4.Question: Write a program to reverse the elements of a 1D array.

5.Question: Write a program to search for an element in a 1D array. If the element is found, print its index; otherwise, print "Element not found

6.Question: Write a program to find and print duplicate elements in a 1D array.

7.Question: Write a program to remove duplicate elements from a 1D array.

8.Question: Write a program to find the second largest element in a 1D array.

9.Question: Write a program to find the missing number in an array of size n, containing numbers from 1 to n with one number missing.

CODE :

```
public class SimpleArrayPrograms {
    public static void main(String[] args) {

        // Hardcoded array
        int[] arr = {3, 5, 2, 5, 1};

        // 1. Display array elements
        System.out.println("1. Array elements:");
        for (int i = 0; i < arr.length; i++) {
            System.out.print(arr[i] + " ");
        }
        System.out.println("\n-------------------------");

        // 2. Sum of all elements
        int sum = 0;
        for (int i = 0; i < arr.length; i++) {
            sum += arr[i];
        }
        System.out.println("2. Sum = " + sum);
        System.out.println("-------------------------");

        // 3. Find max and min
        int max = arr[0];
        int min = arr[0];
        for (int i = 1; i < arr.length; i++) {
            if (arr[i] > max) max = arr[i];
            if (arr[i] < min) min = arr[i];
        }
        System.out.println("3. Max = " + max + ", Min = " + min);
        System.out.println("-------------------------");

        // 4. Reverse array
        System.out.println("4. Reversed array:");
        for (int i = arr.length - 1; i >= 0; i--) {
            System.out.print(arr[i] + " ");
        }
        System.out.println("\n-------------------------");
```

```java
// 5. Search element
int key = 2;
boolean found = false;
for (int i = 0; i < arr.length; i++) {
    if (arr[i] == key) {
        System.out.println("5. Element " + key + " found at index " + i);
        found = true;
        break;
    }
}
if (!found) {
    System.out.println("5. Element " + key + " not found");
}
System.out.println("-------------------------");

// 6. Find duplicates
System.out.println("6. Duplicate elements:");
boolean hasDuplicate = false;
for (int i = 0; i < arr.length; i++) {
    for (int j = i + 1; j < arr.length; j++) {
        if (arr[i] == arr[j]) {
            System.out.println(arr[i]);
            hasDuplicate = true;
            break;
        }
    }
}
if (!hasDuplicate) System.out.println("No duplicates");
System.out.println("-------------------------");

// 7. Remove duplicates
System.out.println("7. Array without duplicates:");
int[] temp = new int[arr.length];
int index = 0;
for (int i = 0; i < arr.length; i++) {
    boolean isDuplicate = false;
    for (int j = 0; j < i; j++) {
        if (arr[i] == arr[j]) {
            isDuplicate = true;
            break;
        }
    }
    if (!isDuplicate) {
        temp[index++] = arr[i];
    }
}
for (int i = 0; i < index; i++) {
    System.out.print(temp[i] + " ");
}
System.out.println("\n-------------------------");

// 8. Second largest element
int first =0;
int second =0;
for (int i = 0; i < arr.length; i++) {
    if (arr[i] > first) {
        second = first;
        first = arr[i];
    } else if (arr[i] > second && arr[i] != first) {
        second = arr[i];
    }
}
    System.out.println("8. Second largest = " + second);
```

```
        System.out.println("------------------------");

        // 9. Missing number from 1 to n
        int[] nums = {1, 2, 4, 5}; // 3 is missing
        int n = 5;
        int total = n * (n + 1) / 2;
        int actualSum = 0;
        for (int i = 0; i < nums.length; i++) {
            actualSum += nums[i];
        }
        int missing = total - actualSum;
        System.out.println("9. Missing number is: " + missing);
    }
}
```